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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,706	06/04/2001	Sridhar Gollamudi	3	4965

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EXAMINER

PERILLA, JASON M

ART UNIT	PAPER NUMBER
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2611

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 09/873,706	Applicant(s) GOLLAMUDI, SRIDHAR	
	Examiner Jason M. Perilla	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-13 are pending in the instant application.

Response to Argument/Amendment

2. Applicant's arguments, filed March 13, 2007, with respect the prior art rejections of claims 1-13 set forth in the office action dated December 13, 2006 have been considered, but they are not persuasive.

While the Applicant argues that Harrison's coefficient " α " does not cover the claimed "correlation coefficient" limitation, the Applicant flatly disregards current legal precedent and makes a nonsensical argument. MPEP § 2111 provides:

During patent examination, the pending claims must be "**given their broadest reasonable interpretation consistent with the specification.**" The Federal Circuit's en banc decision in *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) expressly recognized that the USPTO employs the "broadest reasonable interpretation" standard:

The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

With respect to the coefficient " α ", the specification of the instant application provides, on page 9, "[t]he code correlation coefficient λ is a coefficient that can be used by the transmitter to control the relative amounts of beamforming and orthogonal coding that are applied." In Harrison, an ***identical function*** for the coefficient " α " is disclosed (col. 8, lines 5-35). Therefore, the Examiner strongly asserts that the coefficient " α " of Harrison meets the claimed "correlation coefficient" limitation of independent claim 1 *even without "broadening"* any interpretation of the claim language.

Further, although the Applicant argues that the combination of Harrison and Forssen is improper because the combination is lacking any motivation to combine or modify the prior art (suggesting that a rigid TSM approach is required by precedent of the CAFC), the Supreme Court has expressly abrogated any rigid requirement of a teaching, suggestion, motivation requirement in the combination of prior art references in its recent *KSR v. Teleflex* decision. Additionally, recent decisions of the CAFC steer away from a rigid TSM requirement. See, e.g., *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F. 3d 1356, 1367 (2006) ("Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense"); *Alza Corp. v. Mylan Labs., Inc.*, 464 F. 3d 1286, 1291 (2006) ("There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine . . ."). Therefore, contrary to the Applicant's position and reliance upon specific, out of context and abrogated, case law, a rigid TSM requirement is not required in the determination of obviousness.

A rigid TSM requirement not being required, the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966) which may be applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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It is noted by the Examiner that, considering at least the first and second inquiries, the scope of the prior art reference Harrison, is ***strictly analogous*** to that of the instant application. In fact, the prior art reference Harrison clearly provides for the claimed "transmitting signals from at least two antennae comprising the steps of: . . . in response to the at least one correlation coefficient, selecting at least one of orthogonal coding and beamforming for transmitting signals using the at least two antennae" as applied below. Further, Harrison discloses "determining at least one correlation coefficient" from a signal received by the antennae. The second inquiry reveals that the only difference between the prior art reference Harrison and the instant claim 1 is that the instant application specifies determining the correlation coefficient "between signals received" by the at least two antennae. Harrison discloses at least two antennae and that the correlation coefficient is determined from a signal received by the antennae, but does not specify that it is determined *between signals* received such antennae. Additionally, it is noted that the specification of the instant application does not disclose any secondary factors of non-obviousness such as (1) the invention's commercial success, (2) long felt but unresolved needs, (3) the failure of others, (4) skepticism by experts, (5) praise by others, (6) teaching away by others, (7) recognition of a problem, (8) copying of the invention by competitors, or (9) other relevant factors. In fact, the instant specification does not even suggest that the modification of Harrison's invention to determine a correlation coefficient *between signals* received (as compared to Harrison's - from a received signal) presents any advantage or solves any particular problem in the art.

Finally, a suggestion in the prior art to combine not being rigidly required, Forssen yet provides an objective suggestion to combine which is present in the prior art. Namely, that cross-correlation between the same signal received between different antennas can be performed to determine instantaneous impairment properties between the two antennas (Forssen; col. 7, lines 14-19).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison (U.S. Pat. No. 6154485 – cited in IDS) in view of Forssen et al (US 6173014; hereafter “Forssen” – previously cited).

Regarding claim 1, Harrison discloses a method of transmitting signals from at least two antennae (fig. 1; refs. 112, and 118) comprising the steps of: determining at least one correlation coefficient (α ; col. 7, lines 50-52) from feedback signals received by the antennae (col. 8, lines 30-36); and in response to the at least one determined coefficient selecting at least one of orthogonal coding and beamforming for transmitting signals using the at least two antennae (fig. 5; col. 8, lines 4-35). As discussed above, the correlation coefficient α utilized in figure 4 is a correlation coefficient because it determines the amount correlation between the two signals 108 and 110 respectively transmitted from the two antennae. Harrison discloses determining the at least one

correlation coefficient from the feedback signal (col. 8, lines 30-36) received by the transceiver (fig. 1, ref. 52) but does not explicitly disclose that the feedback signal is received between both of the two antenna. However, Forssen teaches, in a multiple antenna system (fig. 5, refs. 270A and 270B), that cross-correlation between the same signal received between different antennas can be performed to determine instantaneous impairment properties between the two antennas (col. 7, lines 14-19). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the cross-correlation technique of Forssen in the method of Harrison because it could be utilized to determine impairment properties between the two antenna such that the correlation coefficient could be adjusted to aid in the transmission of signals.

Regarding claim 2, Harrison in view of Forssen disclose the limitations of claim 1 as applied above. Further, Harrison discloses that the step of determining at least one correlation coefficient between the received signals comprises determining at least one amplitude correlation coefficient (fig. 5). The coefficient α of figure 5 determines the amplitude correlation of the various input signals for transmission (fig. 5, refs. 72 and 74) to the various antenna by the weight multipliers (fig. 5, refs. 172 and 176) by the function $(1 - \alpha^2)^{1/2}$. Therefore, the correlation coefficient determines at least one amplitude correlation coefficient.

Regarding claim 3, Harrison in view of Forssen disclose the limitations of claim 1 as applied above. Harrison discloses determining at least one correlation coefficient, but does not disclose that the step of determining at least one correlation coefficient

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comprises determining at least one phase correlation coefficient. The correlation coefficient of Harrison, α , is used to control the relative amount of beamforming to orthogonal coding used in the transmission (col. 8, lines 4-35). It is purely a real value having amplitude but not phase correspondence. However, one skilled in the art is familiar with adaptive beamforming and the use of phase adjustments applied to signals for the various antenna facets used in the transmission of a beamformed signal.

Forssen teaches an adaptive beamforming system (fig. 4). Forssen also discloses that various phase shifts are made to the signals being applied to the various antenna facets to create a beam (col. 5, line 60-col. 6, line 17; *col. 6, lines 4-6*). Thereby, with the use of amplitude *and phase* information applied to the various signals transmitted to create a beam, the downlink carrier-to-interference ratio is improved. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to determine a phase correlation coefficient as taught by Forssen in the method of Harrison in view of Forssen because the phase information can be advantageously utilized to create the adaptive beam which results in a lower carrier-to-interference ratio on the downlink.

Regarding claim 4, Harrison in view of Forssen disclose the limitations of claim 3 as applied above. Further, as broadly as claimed, it is necessary that the at least one phase correlation coefficient α of Harrison's figure 5 is estimated because it is generated from the channel feedback (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6).

Regarding claim 5, Harrison in view of Forssen disclose the limitations of claim 1 as applied above. Further, as broadly as claimed, Harrison discloses that the step of

determining at least one correlation coefficient (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6) comprises determining at least one correlation between received signals.

Regarding claim 6, Harrison in view of Forssen discloses the limitations of claim 1 as applied above. Further, Harrison discloses that the step of selecting at least one of orthogonal coding or beamforming comprises selecting a proportion of orthogonal coding relative to a proportion of beamforming of the transmitting signals (col. 8, lines 4-35).

Regarding claim 7, Harrison in view of Forssen disclose the limitations of claim 6 as applied above. Further, Harrison discloses that the at least one correlation coefficient varies between a first level and a second level (col. 7, lines 59-61).

Regarding claim 8, Harrison in view of Forssen disclose the limitations of claim 13 as applied above. Further, Harrison discloses that the at least one correlation coefficient having a level between the first and second levels results in selecting both beamforming and orthogonal coding for transmitting (col. 8, lines 22-35).

Regarding claim 9, Harrison in view of Forssen disclose the limitations of claim 13 as applied above. Further, Harrison discloses that the at least one correlation coefficient determines the proportion of beamforming relative to orthogonal coding used for transmitting (col. 8, lines 4-35).

Regarding claim 10, Harrison in view of Forssen disclose the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient being at a level that is closer to the first level results in transmitting more beamforming than orthogonal coding (col. 8, lines 4-35).

Regarding claim 11, Harrison in view of Forssen disclose the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient being at a level that is closer to the second level results in transmitting using more orthogonal than beamforming (col. 8, lines 4-35).

Regarding claim 12, Harrison in view of Forssen disclose the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient relative to the first and second reference levels determines the relative amounts of beamforming relative to orthogonal coding used for transmitting (col. 8, lines 4-35).

5. Regarding claim 13, Harrison in view of Forssen disclose the limitations of claim 7 as applied above. Further, Harrison discloses that the at least one correlation coefficient being substantially equal to the first level results in selecting beamforming for transmitting and wherein the at least one correlation coefficient being substantially equal to the second level results in selection orthogonal coding for transmitting (col. 8, lines 4-35).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

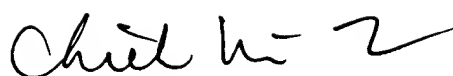
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Jason M. Perilla
May 2, 2006

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jmp

A handwritten signature in black ink, appearing to read "Chieh M. Fan", with a stylized flourish at the end.

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER